



*DSEAR Achieving a Safer Environment*

DODMAN WHITE PAPER

**DSEAR**

**A SUMMARY OF  
DANGEROUS SUBSTANCES AND EXPLOSIVE  
ATMOSPHERES REGULATIONS**

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## Introduction

This white paper is written to provide an overview of DSEAR. The importance of these regulations may be overlooked by employers who have a legal responsibility to keep their employees safe. Too often, employers attempt to delegate the responsibility of compliance to suppliers who do not have sufficient knowledge of all risks to provide safe solutions for the storage, processing or handling of dangerous substances.

These regulations place many obligations on the Employer that extend beyond the equipment supply. Employers must be familiar with these obligations to stay within UK law. Every Employer in Great Britain that uses substances that can catch fire, oxidise or explode must comply with these regulations unless they are explicitly exempt.

It is not intended in this white paper to provide a complete account of DSEAR or any other regulation. The purpose of this paper is to provide an overview only to assist in a better holistic understanding of the requirements of DSEAR to enable a clearer view when starting to understand these regulations.

This paper does not attempt to describe the technical solutions required to eliminate or control the risk of fire or explosion. A reference section at the back of this paper provides further reading.

## DSEAR

The (DSEAR) Dangerous Substances and Explosive Atmosphere Regulations 2002 (SI 2002/2776) set minimum requirements for protecting workers from fire and explosion risks related to dangerous substances and potentially explosive atmospheres.

## Responsibility

The Employer is responsible for assessing and controlling the risk from dangerous substances as specified by DSEAR. Failure to do this is enforceable by the HSE under the Health and Safety at Work Act 1974 (HSW Act).

## Requirements

The following provides a very brief summary of the Employers responsibilities

- find out what dangerous substances are in their workplace
- identify and classify areas of the workplace where explosive atmospheres may occur
- determine the risks of fire or explosion
- remove the risks, or control the risks if not possible to remove
- implement controls to reduce the effects of any incidents involving dangerous substances
- prepare plans and procedures to deal with accidents, incidents and emergencies
- inform and train employees to control or deal with the risks
- identify the content of pipes and containers

## Dangerous Substances

DSEAR defines dangerous substances as any substance which is explosive, oxidising or flammable. These range from the obvious, such as flammable chemicals, petrol, cellulose paint thinners and welding gases, to the less obvious – engine oil, grease, packaging materials, dust from wood, flour and sugar.

It is hard to comprehend a business where these substances do not occur. Therefore it is reasonable to assume that DSEAR is relevant to all companies unless exempt in Regulation 3.

## Where DSEAR applies

It is perhaps easier to define where DSEAR does not apply. Firstly DSEAR only applies to workplaces in Great Britain. DSEAR does not apply to maritime activities or gas appliances. DSEAR does not apply to the manufacture, handling, or storage of materials designed to cause an explosion. There are some special conditions applied for medical use, mining and the transport of dangerous substances. Read Regulation 3 if you feel your business may be exempt.

## DSEAR and ATEX

SI 2002/2776 DSEAR shares similarities with European directives. Indeed DSEAR implemented two European directives, the ATEX Users Directive 99/92/EC and the Chemical Agents Directive 98/24/EC.

These directives were mirrored in UK legislation using two statutory instruments. SI 1996/192: The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996 and SI 2015/0021: The Classification, Labelling and Packaging of Chemicals.

Note: ATEX 2014/34/EU Manufacturers Directive is not directly a requirement of DSEAR. This directive governs the requirements of equipment intended for use in potentially explosive atmospheres. The UK statutory instrument is 2016/1107. However, ATEX certified equipment remains the preferred route to ensure the correct equipment specification for specific hazardous areas.

Brexit has had little impact on DSEAR as the regulations continue to use statutory instruments which were in place before Brexit.

## The Regulations

The following list of regulations need to be understood, however regulations 5 to 10 provide the main content of DSEAR and requires an indepth understanding. This paper aims to examine these regulations in more detail. Regulation 2 explains the key terms used throughout DSEAR.

Because SI 2002/2776 is a legal document that is not easy to read, the HSE has published an approved code of practice L138. While the ACOP is not law, complying with the ACOP will ensure that you will normally be doing enough to comply with DSEAR. The ACOP provides a guidance section alongside each regulation to offer a fuller explanation of the requirements.

**Regulation 1** Citation and commencement

**Regulation 2** Interpretation

**Regulation 3** Application

**Regulation 4** Duties under these regulations

**Regulation 5** Risk assessment

**Regulation 6** Elimination or reduction of risks from dangerous substances

**Regulation 7** Places where explosive atmospheres may occur

**Regulation 8** Arrangements to deal with accidents, incidents and emergencies

**Regulation 9** Information, instruction and training

**Regulation 10** Identification of hazardous contents of containers and pipes

**Regulation 11** Duty of co-ordination

**Regulation 12** Extension outside Great Britain

**Regulation 13** Exemption certificates

**Regulation 14** Exemptions for Ministry of Defence

**Regulation 15** Amendments

**Regulation 16** Appeals and revocations

**Regulation 17** Transitional provisions

## Regulation 5 Risk assessment

**DSEAR does not allow any new work activity involving a dangerous substance to commence without completing a risk assessment and implementing all measures required by DSEAR.**

A detailed risk assessment is needed, identifying:

- Where dangerous materials are stored, handled and used
- The hazardous properties for each substance. Note: hazardous properties for the same substance may differ throughout the plant, some static, some as a cloud (see EN60079-10-1 and EN60079-10-2).
- The work processes involved
- Quantity of the substance
- Possibility of mixtures of substances
- Handling, storage and transport of substances
- Activities including production, maintenance and failure
- Possibility for an explosive atmosphere to occur

- Possible ignition sources (see EN1127-1)
- The magnitude of anticipated fire or explosion
- Connected areas which may allow the propagation of fire or explosion
- The effect of measures that have or will be taken in Regulation 6

Review this data periodically and update after any change.

Keep a copy of the risk assessment and record

- Measures that have or will be taken to satisfy DSEAR
- Detailed information to prove compliance with Provision and Work Use of Work Equipment Regulations 1998 (PUWER).
- Where an explosive atmosphere may occur, zones (see Regulation 7.1 Schedule 2)
- Details of equipment suitable for use in the explosive atmosphere
- Verification that the system is safe
- Coordinated responsibility when required

## Regulation 6 Elimination or reduction of risks from dangerous substances

**The Employer must ensure that the risk identified in the risk assessment are either eliminated or reduced so far as reasonably practicable.**

The term “Reduced so far as reasonably practicable (RSFARP)” may be seen as ambiguous and offering an excuse to ignore. However, following an incident, RSFARP or “As low as reasonably practicable (ALARP)” will be tested in law. The Employer would be wise to ensure that a judge would draw the same conclusion. The HSE has published guidelines to help explain this term.

### [HSE explanation of ALARP](#)

**The Employer must:**

- Eliminate the presence of a dangerous substance

If it is not possible to eliminate the dangerous substance, the Employer must:

Use the following measures in order of priority to reduce the risk of fire or explosion:

- Reduce the quantity of a dangerous substance used
- Avoid the release of the dangerous substance
- Control the release of a dangerous substance
- Prevent an explosive atmosphere from occurring (consider ventilation)
- Collect, contain and remove a dangerous substance to a safe place or render safe
- Remove ignition sources
- Remove adverse conditions that cause harm
- Segregate incompatible substances

Mitigate the harmful effects of a fire or explosion by:

- Reduce the number of people exposed to the risk
- Avoid the propagation of fires or explosion
- Provide explosion relief to limit pressure
- Provide explosion suppression
- Contain the explosion
- Provide personal protective equipment (PPE)

**In addition, the Employer must:**

- Ensure the safe handling, storage and transport of dangerous substances
- Ensure continuous and ongoing effort to eliminate or reduce risk
- Ensure that the workplace is designed, operated and maintained to reduce risk (as detailed in Schedule 1)

## Regulation 7 Places where explosive atmospheres may occur

**The Employer must:**

- Classify hazardous areas using zones
- Only use equipment suitable for the specific hazardous area (ATEX compliant equipment)
- Use signs to identify the hazardous area
- A competent person must verify explosion safety
- Use appropriate antistatic clothing



## Regulation 8 Arrangements to deal with accidents, incidents and emergencies

The Employer must prepare plans to deal with accidents, incidents, and emergencies, including evacuation, escape, and rescue. The detailed plan will include first aid, safety drills, and testing to protect people in a fire or explosion. The Employer must provide information on the hazards, the escape routes and the response systems to ensure safe evacuation.

## Regulation 9 Information, instruction and training

The Employer must provide information and training for employees and contractors on the dangerous substances present, the hazards, precautions and actions necessary to remain safe.

## Regulation 10 Identification of hazardous contents of containers and pipes

The Employer must provide clear information to describe the contents of pipes and containers. The regulation refers to four other regulations:

- SI 1996/341 The Health and Safety (Safety Signs and Signals) Regulations
- SI 1999/3106 The Good Laboratory practice
- SI 2009/716 The Chemicals(Hazard Information and Packaging for Supply) Regulations 2009
- SI 2009/1348 The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009



## References

The following references provide information on DSEAR and related subjects

### SI 2002/2776 The Dangerous Substances and Explosive Atmospheres Regulations 2002

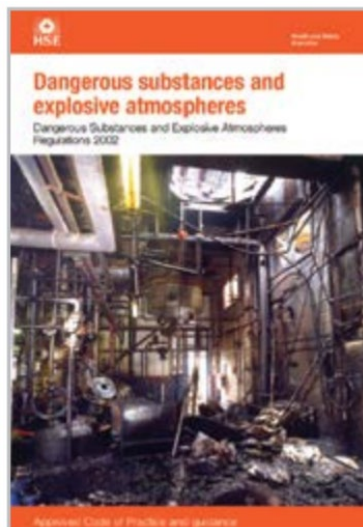
<https://www.legislation.gov.uk/uksi/2002/2776/made/data.pdf>

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STATUTORY INSTRUMENTS	
<b>2002 No. 2776</b>	
<b>HEALTH AND SAFETY</b>	
The Dangerous Substances and Explosive Atmospheres Regulations 2002	
<i>Made</i>	7th November 2002
<i>Laid before Parliament</i>	15th November 2002
<i>Coming into force</i>	
<i>All regulations except for regulations 5(4)(c), 7, 11, 15(2), 16(2) and 17(1) to (3)</i>	9th December 2002
<i>Regulations 15(2) and 16(2)</i>	5th May 2003
<i>Regulations 5(4)(c), 7, 11 and 17(1) to (3)</i>	30th June 2003

### L138 Dangerous Substances and Explosive Atmospheres

<https://www.hse.gov.uk/pubns/priced/l138.pdf>



## The Health and Safety (Safety Signs and Signals) Regulations 1996

<https://www.legislation.gov.uk/uksi/1996/341/made/data.pdf>

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STATUTORY INSTRUMENTS

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**1996 No. 341**

### HEALTH AND SAFETY

The Health and Safety (Safety Signs  
and Signals) Regulations 1996

*Made* - - - - 18th February 1996  
*Laid before Parliament* 23rd February 1996  
*Coming into force* - - 1st April 1996

## The Good Laboratory Practice Regulations 1999

[https://www.legislation.gov.uk/uksi/1999/3106/pdfs/uksi\\_19993106\\_en.pdf](https://www.legislation.gov.uk/uksi/1999/3106/pdfs/uksi_19993106_en.pdf)

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STATUTORY INSTRUMENTS

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**1999 No. 3106**

### HEALTH AND SAFETY

The Good Laboratory Practice Regulations 1999

*Made* - - - - 18th November 1999  
*Laid before Parliament* 19th November 1999  
*Coming into force* - - 14th December 1999

## The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009

<https://www.legislation.gov.uk/uksi/2009/716/data.pdf>

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STATUTORY INSTRUMENTS

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**2009 No. 716**

### HEALTH AND SAFETY

The Chemicals (Hazard Information and  
Packaging for Supply) Regulations 2009

*Made* - - - - 16th March 2009  
*Laid before Parliament* 16th March 2009  
*Coming into force* - - 6th April 2009

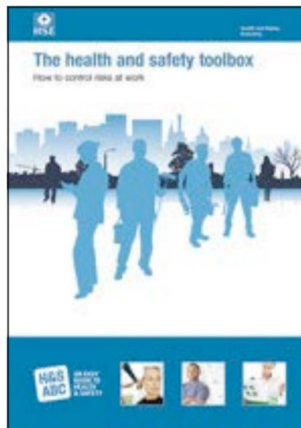
## SI 2009/1348 The carriage of dangerous goods and use of transportable pressure equipment regulations 2009

<https://www.legislation.gov.uk/uksi/2009/1348/made/data.pdf>

STATUTORY INSTRUMENTS	
<b>2009 No. 1348</b>	
<b>HEALTH AND SAFETY</b>	
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009	
Made	27th May 2009
Laid before Parliament	3rd June 2009
Coming into force	1st July 2009

## The health and safety toolbox

<https://www.hse.gov.uk/pubns/priced/hsg268.pdf>



## Controlling fire and explosion risks in the workplace

<https://www.hse.gov.uk/pubns/indg370.pdf>



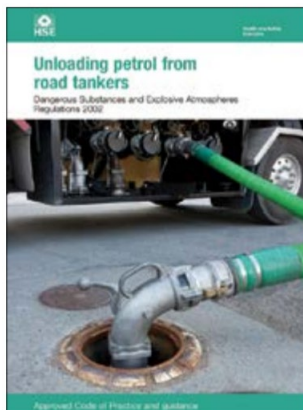
## Chemical warehousing

<https://www.hse.gov.uk/pubns/priced/hsg71.pdf>



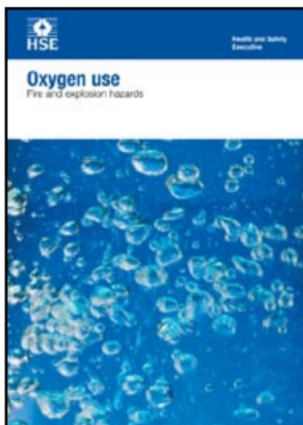
## Unloading petrol from road tankers

<https://www.hse.gov.uk/pubns/priced/l133.pdf>



## Oxygen use

<https://www.hse.gov.uk/pubns/indg459.pdf>



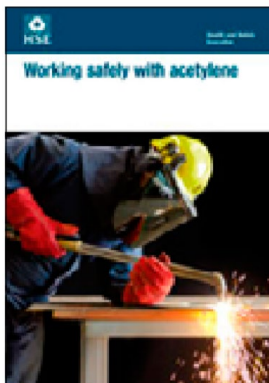
## Hot work on small tanks and drums

<https://www.hse.gov.uk/pubns/indg314.pdf>



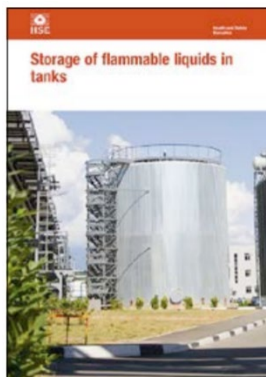
## Working safely with acetylene

<https://www.hse.gov.uk/pubns/indg327.pdf>



## Storage of flammable liquids in tanks

<https://www.hse.gov.uk/pubns/priced/hsg176.pdf>



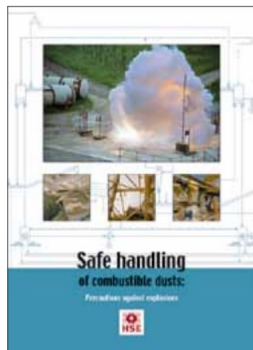
## Warehousing and storage

<https://www.hse.gov.uk/pubns/priced/hsg76.pdf>



## Safe handling of combustible dusts

<https://www.hse.gov.uk/pubns/priced/hsg103.pdf>



## Dust testing

[https://www.shapa.co.uk/technical-downloads/Updated%20Papers%20May%202015/dust\\_testing.pdf](https://www.shapa.co.uk/technical-downloads/Updated%20Papers%20May%202015/dust_testing.pdf)



SHAPA TECHNICAL PAPER 16

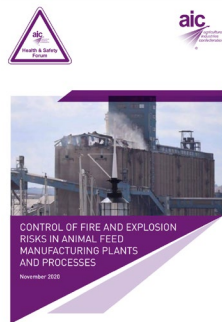
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Dust Testing  
for  
DSEAR and ATEX Compliance

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## Control of fire and explosion risks in animal feed manufacturing plants

<https://www.shapa.co.uk/technical-downloads/Control-of-Fire-Explosion-Risks-in-Animal-Feed-Manufacturing.pdf>



## Practical guidance for suppliers and operators of solids handling equipment for potentially explosive dusts

<https://www.shapa.co.uk/technical-downloads/Atex-Updated.pdf>



## Establishing a basis of safety

[https://www.shapa.co.uk/technical-downloads/Updated%20Papers%20May%202015/Atex%20Articles/ATEX+Establishing+a+Basis+of+Safety+eBook\\_V1-Complete-120319.pdf](https://www.shapa.co.uk/technical-downloads/Updated%20Papers%20May%202015/Atex%20Articles/ATEX+Establishing+a+Basis+of+Safety+eBook_V1-Complete-120319.pdf)

ATEX Establishing a  
Basis of Safety

## **Other useful links**

### **Fire Protection Association**

<https://www.thefpa.co.uk/>

### **HSE guidance on fire and explosion**

<https://www.hse.gov.uk/fireandexplosion/>

### **Storage of flammable liquids in process areas**

<https://www.hse.gov.uk/fireandexplosion/storageflammliquids.htm>

### **HSE DSEAR Guidance**

<https://www.hse.gov.uk/fireandexplosion/dsear.htm>

### **Electricity in potentially explosive locations**

<https://www.hse.gov.uk/electricity/atex/index.htm>

### **ALARP – As low as reasonably practicable**

<https://www.hse.gov.uk/comah/alarp.htm#:~:text=ALARP%20%2D%20As%20low%20as%20reasonably,t o%20see%20workplace%20risks%20controlled.>